UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,259	06/25/2004	Paul M. Lindberg	104497-423-PCT(US)	8922

7590 11/30/2005

Goodwin Procter
103 Eisenhower Parkway
Roseland, NJ 07068

EXAMINER	
PHAM, LEDA T	
ART UNIT	**PAPER NUMBER**
2834	

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/500,259	LINDBERG ET AL.	
	Examiner	Art Unit	
	Leda T. Pham	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19 and 21-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *21, 23* is/are allowed.

6)☒ Claim(s) *1-19 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This office action is in response to amendment filed on 9/30/05.

2. Claims 1 – 19, 21 – 23 are presented for examination. Claim 20 is canceled.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3 – 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Blazek et al. (U.S. Patent No. 6,531,801 B1).

Referring to claims 1 and 8, AAPA teaches a magnetic motor (figure 1 - 2) comprising:

a first motor assembly comprising:

a first bearing surface layer (106), and

a first magnet (105), fixed with respect to the first bearing surface layer, structured to generate a first magnetic field; and

a second motor assembly comprising:

a second bearing surface layer (109), located so that at least a portion of the second bearing surface layer is in contact with at least a portion of the first bearing surface layer, and

a second magnet (110), fixed with respect to the second bearing surface layer (109), structured to generate a second magnetic field, with the first and second motor assemblies being structured so that forces caused by the interaction of the first and second magnetic fields will cause the first motor assembly and the second motor assembly to move relative to each other, and with the first and second bearing surface layers being in moving contact to at least partially guide the relative motion of the first and second motor assemblies.

However, AAPA fails to teach the second bearing surface layer comprising a material that has relative magnetic permeability of x, wherein x is greater than 2.0 and the second bearing surface has a magnetic permeability, saturation characteristic, shape and location so that at least a portion of the second bearing surface layer is magnetically saturated by a magnetic field of the second magnet.

Blazek teaches a magnetic motor having a second bearing surface layer (62) with relative magnetic permeability between about 1500 and about 2500, and having a magnetic permeability, saturation characteristic, shape and location so that at least a portion of the second bearing surface layer is magnetically saturated by a magnetic field of the second magnet to convert electrical energy into mechanical work in a simple rotor structure.

Thus, it would have been obvious to one having ordinary skill in the art a the time the invention was made to modify the motor having a second bearing surface layer in relative magnetic permeability greater than 2.0 as taught by Blazek. Doing so would provide a simple rotor structure to convert electrical energy into mechanical work.

Referring to claim 3, Blazek teaches the motor wherein x is greater than 100 (x is between 1500 to 2500).

Referring to claims 4 and 11, AAPA teaches the motor wherein: the first motor assembly is a stator (104);

the first bearing surface layer comprises a bushing (106);

the first magnet is an electromagnetic (105) such that the first magnetic field can be selectively controlled;

the second motor assembly comprises a shaft (114);

the second bearing surface layer (109) is located over at least a portion of the shaft and

the second magnet (110) located within the shaft and comprises at least one permanent magnet.

Referring to claim 5, AAPA teaches the motor wherein the motor is a doubly salient motor.

Referring to claim 6, AAPA teaches the motor wherein the shaft comprises:

a plurality of annular, permanent magnets (110);

a plurality of pole pieces (112), with the magnets and the pole pieces being assembled in an alternating manner; and

a sleeve (109) disposed at least partially around the alternating magnets and pole pieces, with the sleeve comprising an outer major surface, and with the second bearing surface layer being located at least partially along the outer major surface of the sleeve.

Referring to claim 7, Blazek teaches the motor wherein the second bearing surface layer (62) comprises hard steel (lines 1 – 5, column 7).

Referring to claim 9, AAPA teaches the motor wherein the second bearing surface layer (112) comprises: a saturated portion (the portion opposing to stator pole) that is magnetically saturated by the magnetic field of the second magnet; and

an unsaturated portion (the portion that remoted from the magnet 110) that is not magnetically saturated by the magnetic field of the second magnet.

Referring to claim 10, AAPA teaches the motor wherein:

the saturated portion comprises a portion of the second bearing surface layer that is located in the vicinity of the second magnet, between the poles of the second magnet; and

the unsaturated portion comprises a portion of the second bearing surface layer that is located in the vicinity of the poles of the second magnet (figure 2).

Referring to claim 12, AAPA teaches the motor wherein during normal operation of the motor, a portion of second bearing surface layer proximate to poles of the at least one permanent magnet are magnetically unsaturated and a portion of the second bearing surface layer located between the poles is magnetically saturated (figure 2).

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of AAPA and Blazek as applied to claim 1 above, and further in view of Chu et al. (U. S. Patent No 5,159,219).

Referring to clam 2, the combination of AAPA and Blazek teaches the claimed invention, except for the added limitation of the magnetic motor is a high thrust magnetic motor.

Chu teaches in his invention the magnetic motor is a high thrust magnetic motor to increase the magnetic field of the motor.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the motor with a high thrust magnetic motor as taught by Chu. Doing so would increase the magnetic field in the motor.

6. Claims 13 – 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Roesel et al. (U.S. Patent No. 6,229,243 B1).

Referring to claim 13, AAPA teaches a magnetic motor (figure 2) comprising:

a first motor assembly comprising:

a first bearing surface layer (106), and

a first magnet (105), fixed with respect to the first bearing surface layer, structured to generate a first magnetic field; and

a second motor assembly comprising:

a second bearing surface layer (109), located so that at least a portion of the second bearing surface layer is in contact with at least a portion of the first bearing surface layer, the second bearing surface layer comprising a material that has a residual magnetization value of x, and

a second magnet (110), fixed with respect to the second bearing surface layer, structured to generate a second magnetic field, with the first and second motor assemblies being structured so that forces caused by the interaction of the first and second magnetic fields wi11 cause the first motor assembly and the second motor assembly to move relative to each other, and with the first and second bearing surface layers being in moving contact to at least partially guide the relative motion of the first and second motor assemblies.

However, APAA does not teach x is greater than 500 Gauss.

Roesel teaches a rotor construction of controlled pole electric machines with layers fixed with the rotor having a residual magnetization value of 10,000 gauss to compensate for the variations occurring radially throughout the volume of the magnetic material in the flux densities of the magnetic field.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the second bearing surface layer with a residual magnetization value greater than 500 gauss as taught by Roesel. Doing so would provide an efficient rotor in a high speed electric machine.

Referring to claim 14, Roesel teaches the motor wherein x is greater than 1000 Gauss (lines 17 – 18 column 7).

Referring to claim 15, AAPA teaches the motor wherein:

the first motor assembly is a stator;

the first bearing surface layer comprises a bushing;

the first magnet is an electromagnet, such that the first magnetic field can be selectively controlled;

the second motor assembly comprises a shaft;

the second bearing surface layer is located over at least a portion of the shaft; and

the second magnet located within the shaft and comprises at least one permanent magnet (figure 2).

Referring to claim 16, AAPA teaches the motor wherein the motor is a doubly salient motor.

Referring to claim 17, AAPA teaches the motor wherein the shaft comprises: a plurality of annular, permanent magnets (110);

a plurality of pole pieces (112), with the magnets and the pole pieces being assembled in an alternating manner; and

a sleeve (109) disposed at least partially around the alternating magnets and pole pieces, with the sleeve comprising an outer major surface, and with the second bearing surface layer being located at least partially along the outer major surface of the sleeve.

7. Claims 18 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Sato et al. (U.S. Patent No. 6,262,507 B1).

Referring to claim 18, AAPA teaches the claimed invention, except for the added limitation of the second bearing surface layer being anisotropic in its magnetic permeability.

Sato teaches a permanent magnet motor with the second bearing surface layer being anisotropic in its magnetic permeability to increasing the magnetic field producing by the rotor magnet.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the second bearing surface layer as taught by Sato. Doing so would provide a high performance of a permanent magnet motor regarding to a large induces voltage and small torque ripples.

Referring to claim 19, AAPA teaches the motor wherein:

the first motor assembly is a stator;

the first bearing surface layer comprises a bushing;

the first magnet is an electromagnet, such that the first magnetic field can be selectively controlled;

the second motor assembly comprises an elongated shaft defining a lengthwise direction and a radial direction;

the second bearing surface layer is located over at least a portion of the shaft; and

the second magnet located within the shaft and comprises at least one permanent magnet (figure 2).

8. With regard to claim 22 the method of making a magnetic shaft would be inherent and obvious since the prior art references meet the structural limitations of the claimed device.

Allowable Subject Matter

9. Claims 21 and 23 are allowed.

10. The following is an examiner's statement of reasons for allowance: the record of prior art does not show a magnetic motor having a second bearing surface layer with a magnetic permeability in the radial direction is y, and a magnetic permeability of in the lengthwise direction is x; and y is greater than x.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

11. Applicant's arguments, see the remark, filed on 9/30/05, with respect to the rejection(s) of claim(s) 1 - 22 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leda T. Pham whose telephone number is (571) 272-2032. The examiner can normally be reached on M-F (8:30-6:00) first Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leda T. Pham
Examiner
Art Unit 2834

LTP
November 23, 2005

DARREN SCHUBERG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800